


## Using Health Information Technology to Support Population-Based Clinical Practice

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<b>Organization:</b>	University of Utah
<b>Mechanism:</b>	PAR: HS09-085: Mentored Clinical Scientist Research Career Development Award (K08)
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**Summary:** Acute respiratory infections (ARIs) are a burden to the health care delivery system and the public's health. The overuse of antibiotics for viral infections has contributed to the emergence of antimicrobial resistance and a substantial number of adverse drug events. As a result, research on preventing the overuse of antibiotics is a national priority. This project aims to improve providers' and patients' ability to distinguish viral infections from bacterial infections by providing timely, accessible information about the local incidence of common respiratory viruses via a population health repository and related decision-support tools.


Working closely with Intermountain Healthcare and their flagship pediatric hospital, Primary Children's Medical Center, which is affiliated with the University of Utah Department of Pediatrics, Dr. Gesteland and his team developed GermWatch ( <http://www.intermountainphysician.net/gw>), a reporting system for pediatric and adult respiratory infections that captures routine microbiological testing data from all Intermountain Healthcare system hospitals and clinics. The system generates reports that display pathogen-specific data in graphs and maps that are distributed with a bulleted summary to more than 400 clinicians in the Intermountain West every week. The reports are also available on the GermWatch Web site, which provides a user interface that supports custom queries based on time-periods, age ranges, pathogens, and regions. The overall goals of the project are to develop new tools sets, refine information delivery mechanisms, and further integrate these tools into clinical workflow. This study will address important gaps in patients' and providers' population-based health knowledge and the information technology tools required to fill them.

### Specific Aims:

- Assess primary care clinician use of current population-based ARI health information resources and decision-support tools using focus groups and structured observation. **(Achieved)**
- Refine population-based ARI health information resources and decision-support tools to improve clinical information system workflow integration and patient communication. **(Ongoing)**
- Implement these population-based ARI health information resources and decision-support tools in primary and urgent care settings. **(Upcoming)**
- Measure the effects of population-based ARI health information resources and decision-support tools on population-based clinical practice and patient and parent compliance to increase the effectiveness and appropriateness of antibiotic prescribing for ARI. **(Upcoming)**

In addition to the research project goals, Dr. Gesteland is working toward his long-term career goal of utilizing information technology and clinical information systems to optimize the management of common diseases that affect the health of adults and children. Funding from this Mentored Clinical Scientist Research Career Development Award is helping Dr. Gesteland advance his skills through mentorships with experts in advanced epidemiologic and statistical methods, health services research, cognitive psychology of medical decisionmaking, integrated medical systems, health care quality improvement, and biomedical informatics.

**2012 Activities:** Dr. Gesteland and his team made significant progress on the refinement of the dashboard using data collected from provider interviews during 2011. The interviews yielded insight on how current data visualizations could be improved and what additional content and tools (e.g., patient education, ARI guidelines, information about viral testing) providers need. The interviews also helped identify where in the clinical information system and clinic workflow providers would prefer to access these resources. The interviews also identified new issues, including providers' comfort level with office staff access to GermWatch. Refinements were ongoing at the end of the year.

A major accomplishment during the year was the development and launch of the public-facing version of the GermWatch system ( <http://www.GermWatch.org>). This public site was informed by parent focus groups conducted in 2011 and contains content designed to meet the information needs of patients and parents relevant to common respiratory pathogens and the related ARI they cause. Dr. Gesteland and his team developed the general design, layout, and storyboard as well as the individual page content. The Web site was beta tested with Intermountain employees in summer 2012 and launched in November 2012. This site serves as a companion tool that clinics can give patients who want to learn more about conditions and specific pathogens. Dr. Gesteland is working with a new and cutting edge data visualization platform that will serve as the primary information visualization development and delivery tool for both the public- and provider-facing sides of the GermWatch system. They are also currently developing a mobile application that will provide convenient ways for clinicians to access up-to-date surveillance data and a mechanism for delivering push alerts with the latest disease outbreak updates.

In addition, Dr. Gesteland and his team developed and deployed a mobile antibiogram application that provides the last full year's data on antibiogram testing data. They are currently testing the application and devising an evaluation plan.

Dr. Gesteland was invited to give a plenary talk in December 2012 at the International Society for Disease Surveillance in San Diego, at which he described the EpiCanvas infectious disease weather map, an interactive visual exploration of temporal and spatial correlations that depicts regional infectious disease activity at-a-glance.

**Preliminary Impact and Findings:** This project has no findings to date.

**Target Population:** Acute Respiratory Infections, Pediatric\*

**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

**Business Goal:** Knowledge Creation

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\* This target population is one of AHRQ's priority populations.